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WESTERN PLANT STUDIES. III

AVEN NELSON AND J. FRANCIS MACBRIDE

POLYPODIUM VULGARE L. var. **hesperium** (Maxon), n. comb.—*P. hesperium* Maxon, Proc. Biol. Soc. Wash. 13:200. 1900.—The intermountain form with shorter, broader, and usually very obtuse pinnae.

ISOETES OCCIDENTALIS Hend. var. **Piperi** (A. A. Eat.), n. comb.—*I. Piperi* A. A. Eat. Fern Bull. 13:51. 1905; *I. Howellii* Engelm. var. *Piperi* Clute, Fern Allies 258. 1905.—The velum broader and the spores larger with obtuse tubercles.

Muhlenbergia setiglumis (Wats.), n. comb.—*M. sylvatica* Torr. var. *setiglumis* Wats. Bot. King Exped. 378. 1871.—Very closely allied to the eastern *M. sylvatica* Torr., but each confined to its own range.

Streptopus streptopoides (Ledeb.), n. comb.—*Smilacina streptopoides* Ledeb. Fl. Ross. 4:128. 1852; *Kruhsea Tilingiana* Regel Nom. Mem. Soc. Nat. Mosc. 11:122. 1859; *S. brevipes* Baker, Jour. Linn. Soc. 14:592. 1875.—This form of species name is always to be regarded as unfortunate, but at the present time, at least, it must be used in cases like this.

Majanthemum dilatatum (Wood), n. comb.—*Unifolium bifolium* DC. var. *dilatatum* Wood, Proc. Phil. Acad. 154. 1868.—The genus *Majanthemum* is one of the *nomina conservanda* of the international rules. The plant is well worthy of specific rank.

Arenaria macra, n. n.—*A. tenella* Nutt. T. and G. Fl. 11:79. 1838, not Kit. in Schuet. Oestr. Fl. ed. II. 1:662. 1814, a valid species of Austria.

Spergularia bracteata (Robinson), n. comb.—*S. salsuginea* Fenzl. var. *bracteata* Robinson, Syn. Fl. 1:251. 1897.—The bractlike upper leaves are very different in aspect from the apparently entirely Siberian *S. salsuginea*.

DELPHINIUM MENZIESII DC. var. **fulvum**, n. var.—Pubescence, especially above, yellowish-villous and slightly viscid.—Eastern Oregon and adjacent Idaho.

Delphinium stachydeum (Gray), n. comb.—*D. scopulorum* Gray var. *stachydeum* Gray, BOT. GAZ. 12:52. 1887.—One of the most readily distinguished species of the group to which it belongs.

Meconella linearis (Benth.), n. comb.—*Platystigma linearis* Benth. Trans. Hort. Soc. II. 1:407. 1834; *Hesperomecon lineare* (Benth.) Greene, Pitt. 5:146. 1903.—GREENE (*op. cit.*) has called attention to the earlier and valid *Platystigma* of ROBERT BROWN. In our judgment, however, *Hesperomecon* Greene is not distinct from *Meconella* Nutt.

Horkelia Tweedyi (Rydb.), n. comb.—*Ivesia Tweedyi* Rydb. N.A. Fl. 22:288. 1908.—This plant was long included in the nearly related but much more southern *H. utahensis* (Wats.) Rydb. It is consistently distinct from that species, however, and seems to be confined to Washington on the eastern slope of the Cascades. In making this transfer we would call attention to our remarks in BOT. GAZ. 55:375. 1913 on the fallacy of maintaining certain segregate genera in this group.

Trifolium Kennedianum (McD.), n. comb.—*T. involucreatum* Ortega var. *Kennedianum* McD. N.A. Trif. 56. 1910.—The broad, equal, entire involucreal teeth readily distinguish this plant. In the species to which it was referred, the involucreal teeth are sometimes entire, but narrower and very unequal in length.

CARDAMINE CORDIFOLIA Gray var. **Lyallii** (Wats.), n. comb.—*C. Lyallii* Wats. Proc. Am. Acad. 22:466. 1887; *C. cordifolia* Gray subsp. *Lyallii* (Wats.) O. E. Schulz, Engl. Bot. Jahrb. 32:438. 1903.—SCHULZ is undoubtedly justified in no longer maintaining this plant as a species. We give it varietal rank that it may accord with those variations deemed unworthy of specific status, and then treated as varieties by most American botanists.

CLARKIA and its near allies.—In BOT. GAZ. 52:267. 1911, there were separated from *Clarkia* some species that are evidently aberrant in that genus. It is very doubtful whether the restoration of the genus *Phaeostoma* relieved a difficult situation. Granting that *Phaeostoma* has 8 fertile anthers while *Clarkia* has only 4, separating on this basis creates an equal difficulty between *Godetia* and *Phaeostoma* in that both have 8 stamens and the latter may have petals either clawed or not clawed. But the same is true

of *Godetia* if *G. biloba* Wats. be left in the genus. This latter might be transferred to *Phaeostoma* but for its bilobed petals, or to *Clarkia* if judged by its aspect alone. The larger the series of specimens and the more species included in the study, the more probable it seems that unbroken series can be established running through the three genera on the following characteristics:

1. Stamens 4-8 and all alike or in two sets, the one gradually reduced in size and finally to sterility and extinction.
2. Petals from entire to deeply 2 or 3-lobed, and from sessile to long and narrowly clawed.

It would not seem unwise to reduce all three to one genus but for the fact that to do so would again necessitate a number of new combinations.

***Pachylophus psammophilus*, n. sp.**—Wholly glabrous throughout, caulescent, branching near the base, usually 1 dm. or more high: leaves lanceolate, entire or slightly repand, acutish, each attenuate into a petiole with margins narrower than the midrib: calyx tube only twice as long as the narrow acute segments: petals white (drying pink), 2-3.5 cm. long: capsules sessile, narrowly conical, somewhat curved and tapering gradually, 3-3.5 cm. long, not at all tuberculate, slightly angled.

Plants growing in sand dunes in the vicinity of St. Anthony, Idaho. Very distinct in aspect and technical characters from its nearest relative, *P. caespitosus* (Nutt.) Raimann, of South Dakota.

PERIDERIDIA Reichb. Handb. 219. 1837; Meisn. Genera 1:150. 1837; Endl. Gen. Pl. 792. 1838; Steudel, Nom. Bot. ed. II. 2:304. 1841.—*Eulophus* Nutt. in DC. Coll. Mem. 5:69. 1829, not *Eulophus* R. Br. in Bot. Reg. 573. 1821, in the English text.

ROBERT BROWN in 1821 published his new orchidaceous genus *Eulophus*, and though he changed this to *Eulophia* in 1823, the earlier form of the word must, of course, be used. This necessitates, unfortunately, another name for the plants we have known so well as *Eulophus* Nutt. It may be questioned if REICHENBACH really published his genus in his *Handbuch*; certainly he makes no reference to a species, as stated in the *Kew Index*. The genus is given good descriptions by the authorities cited above, however; and STEUDEL publishes it with the species. The following new combinations, together with the type, are noted.

PERIDERIDIA AMERICANA Reichb. ex Steudel, Nom. Bot. ed. II. 2:304. 1841; *Eulophus americanus* Nutt. in DC. Coll. Mem. 5:69. 1829.

Perideridia Parishii (C. and R.), n. comb.—*Eulophus Parishii* C. and R. Rev. N.A. Umbell. 112. 1888.

Perideridia Pringlei (C. and R.), n. comb.—*Eulophus Pringlei* C. and R. *op. cit.* 113.

Perideridia simplex (C. and R.), n. comb.—*Eulophus simplex* C. and R. Contrib. Nat. Herb. 7:112. 1900.

Perideridia Bolanderi (Gray), n. comb.—*Podosciadium Bolanderi* Gray, Proc. Am. Acad. 7:346. 1868; *Eulophus Bolanderi* C. and R. Rev. N.A. Umbell. 112. 1888.

Perideridia californica (Torr.), n. comb.—*Chaerophyllum* (?) *californicum* Torr. Pacif. R.R. Rep. 4:93. 1856; *Eulophus californicus* C. and R. *op. cit.* 114.

DODECATHEON JEFFREYI Van Houtte, Fl. des Serres 16:99. 1865.—It seems doubtful if there are any indigenous plants in this country answering to the original description. Even the specimens from the Californian Sierras that we have seen do not have “hispidulous styles and a capsule valvate from the very apex.” The description was drawn from European garden plants, supposedly grown from Californian seed, but this might easily have been an error. The plant that has long passed as *D. Jeffreyi* seems to be quite variable, and that has led to different forms of it receiving specific names, so that now its name and synonymy seems to be as follows:

DODECATHEON VIVIPARUM Greene, Erythea 3:38. 1895; *D. tetrandum* Suks. ex Greene, *op. cit.* 40; *D. crenatum* Greene, Pitt. 2:74. 1890, not *D. crenatum* Raf.; *D. dispar* A. Nels. Bot. Gaz. 52:369. 1911.

FRASERA NITIDA Benth. var. **Cusickii** (Gray), n. comb.—*F. Cusickii* Gray, Proc. Am. Acad. 22:310. 1887.—This is now represented in herbaria by a number of CUSICK's collections and differs from the species only in the orbicular and concave scales between the filaments. These are nearly entire and surpass the ovary, as is not rare in the species. Both forms occur in Oregon, the variety seemingly confined to the northwestern part of the state.

Phacelia argentea, n. sp.—Differs from *P. magellanica* (Lam.) Coville, in the broad suborbicular or broadly oval densely sericeous leaves (2–4 cm. long, 2–3.5 cm. broad). Although evidently nearest related to *P. magellanica* as understood by BRAND in his discriminating monograph, *P. argentea* is of unique aspect, entirely different from any of the plants referable to this group. The stems and petioles are hispid or hirsute, but the leaf blades are clothed with an appressed (less so beneath) satiny pubescence.

The specimen is imperfect, but the plant is probably robust and tall. Even though only vegetative characters are available for discrimination, there is no evidence that these intergrade, so the plant is proposed as a new species.

Sandy seashore, Chetco, Oregon, June 1884, *Howell* no. 209 (type in Gray Herb.).

GILIA and **COLLOMIA**.—Although BRAND in his recent monograph of the Polemoniaceae maintains *Collomia* as a genus distinct from *Gilia*, it is surely no better marked than some other sections raised to generic rank by many American botanists. “Calyx not ruptured by the maturing capsule” is a good enough (and the only constant) sectional character, but scarcely to be considered generically in a family in which the more natural genera run hopelessly together technically. And when all the *Collomia* species are taken into account, they present no common aspect that might tempt one to treat them as a genus, a characteristic which some of the other sections possess. In accord with this view we are making two necessary transfers.

Gilia mazama (Coville), n. comb.—*Collomia mazama* Coville, Proc. Biol. Soc. Wash. 11:35. 1897.

Gilia tenella (Gray), n. comb.—*Collomia tenella* Gray, Proc. Am. Acad. 8:259. 1870.—The range given in the COULTER and NELSON *Manual* would be more nearly correct, if it read “Mountains of southern Idaho to Oregon and Utah.”

GILIA ACHILLEIFOLIA Benth. var. **Chamissonis** (Greene), n. comb.—*G. Chamissonis* Greene, Erythea 3:105. 1895; subsp. *Chamissonis* (Greene) Brand, Pflanzenreich 4, fam. 250. 111. 1907.—Mostly, if not entirely, replaces in the Northwest the typical form with permanently arachnoid-villous calyx. Both grow in California.

GILIA FLOCCOSA Gray var. *filifolia* (Nutt.), n. comb.—*G. filifolia* Nutt. Jour. Acad. Phil. 1:156. 1848; *Navarettia filifolia* Brand, *op. cit.* 167; *G. virgata* Steud. var. *filifolia* Milliken, Rev. Col. Polem. 39. 1904.—Although *G. virgata* and *G. floccosa* admittedly merge, they are distinct enough in their typical development to warrant their separation, which is conducive to clearness and simplicity when one considers their respective variations. *G. Wilcoxii* A. Nels. Bot. Gaz. 34:27. 1902 is *G. floccosa*. The foregoing variety is distinguished by its shorter, more salverform corolla, the narrow lobes much shorter than the tube.

POLEMONIELLA.—BRAND in his recent monograph of the Polemoniaceae reduces *Polemoniella* Heller, Muhl. 1:57. 1904. This genus is undoubtedly as strong as the *Gilia* segregates he accepts. It not only has the technical characters indicated and the corolla shorter than the calyx, but these combine to give the plants an aspect that suggests *Nemophila* or *Ellisia*. In fact, BRAND marked a specimen (in this herbarium) of *Polemoniella*, *N. breviflora*. Besides *P. micrantha* (Benth.) Heller, the genus contains the following species, both South American.

Polemoniella Gayanum (Wedd.), n. comb.—*Gilia Gayanum* Wedd. Chlor. And. 2:82. 1859; *P. Gayanum* (Wedd.) Brand, Pflanzenreich 4:46. 1907.

Polemoniella antarcticum (Griseb.), n. comb.—*P. antarcticum* Griseb. in Goett. Abh. 6:131. 1854.

HELIOTROPIUM CURASSAVICUM L. var. ***xerophilum*** (Ckll), n. comb.—*H. xerophilum* Ckll. Bot. Gaz. 33:379. 1902; *H. spathulatum* Rydb. Bull. Torr. Bot. Club 30:262. 1903.—COCKERELL has called attention (Proc. Biol. Soc. Wash. 26:204. 1913) to the fact that his name for this large-flowered inland form antedates RYDBERG'S. He is wrong, however, in believing that it is the only form found in New Mexico and Chihuahua, there being collections from these localities that represent the species perfectly. Especially in California and the Southwest intermediates occur which prove the fallacy of trying to maintain the inland plant as a species. *H. oculatum* Heller, Muhl. 1:58. 1904, judging from the author's specimens, is one of these intermediate states. In its best development, however, the variety is

strongly marked by its almost showy flowers and usually broader leaves.

Amsinckia Menziesii (Lehm.), n. comb.—*Echium Menziesii* Lehm. Pug. 2:29. 1830; *A. intermedia* F. and M. Ind. Sem. Hort. Petrop. 2:26. 1835.—PIPER in Contrib. Nat. Herb. 11:480. 1906 cites under *A. intermedia*, "*Eutoca Menziesii*," etc., "not R. Br. 1823." However, LEHMANN did not publish the species as a *Eutoca* but as an *Echium*. Hence his name is five years earlier than that of FISCHER and MEYER's, and there is no earlier *Menziesii* in the genus *Amsinckia*. This variable species should therefore bear the name *A. Menziesii* according to both the American and the international rules of botanical nomenclature. It is possible that some of the segregate species proposed rather recently are valid or at least worthy of varietal rank.

ALLOCARYA SCOULERI (H. and A.) Greene var. **hirta** (Greene), n. comb.—*A. hirta* Greene, Pitt. 1:161. 1887.—Differs from the species in being more or less setosely hispid, the leaves ciliate with widely spreading hairs. It is represented in the Gray Herbarium by SUKSDORF's no. 45, Klickitat County, Washington, May 26, 1881.

ALLOCARYA CUSICKII Greene var. **jucunda** (Piper), n. comb.—*A. jucunda* Piper, Bull. Torr. Bot. Club 29:643. 1902.—In the original description the leaves are said to be glabrous above, but they vary in this respect as in the species. The shorter and relatively broader leaves, together with the more bristly hirsute pubescence, serve to distinguish the variety. The nutlets are essentially the same.

LAPPULA.—The following key and the accompanying notes are given in the hope of helping to clear up the confusion that has existed in regard to our annual species of *Lappula*. No one apparently has ever made a serious effort to determine to what plants the names in literature actually apply, and consequently this section of the genus has reached a nearly chaotic condition.

Nutlets not cupulate, the prickles distinct nearly or quite to the base

Prickles in two rows

Nutlets 2.5–3 mm. long, the granulations on the face minute and even

1. *L. echinata*

Nutlets 4-7 mm. long, the median tuberculations more prominent than the outer

Plant not bushy branched, ashy pubescent; nutlets 4-4.75 mm. long
2. *L. Fremontii*

Plant bushy branched; herbage green; nutlets 6-7 mm. long
3. *L. cenchrusoides*

Prickles in one row. 4. *L. Redowskii*, 4a, and 4b.
Nutlets, at least in part, cupulate

Cup shallow, the prickles united toward the base and forming a spreading flange, scarcely or not at all inflated; nutlets all alike

Pubescence rather soft, little papillose; stems branched above
5. *L. cupulata*

Pubescence harsher, more papillose; stems branched from the base
5a. var. *foliosa*

Cup deep, the inflated margin more or less involute; nutlets frequently dissimilar

Stems branched above; pubescence soft; nutlets dissimilar, strongly tuberculate on sides and face. 6. *L. texana*

Stems branched and floriferous from the base

Nutlets dissimilar. 6a. var. *heterosperma*

Nutlets similar

Faces and sides tuberculate. 6b. var. *homosperma*

Faces and sides smooth. 6c. var. *coronata*

1. LAPPULA ECHINATA Gilib. Fl. Lith. 1:25. 1781: *L. Lappula* (L.) Karst. Deutsch. Fl. 979. 1880-1883.—This widely naturalized species has the prickles of the nutlets quite distinct to the base and in two very evident marginal rows.

2. LAPPULA FREMONTII (Torr.) Greene, Pitt. 4:96. 1899.—*L. erecta* A. Nels. Bull. Torr. Bot. Club 27:268. 1900 as to specimens cited and description in large part.—This was described as having the prickles of the nutlets in a single row. Since they are in two irregular rows in authentic specimens this must have been an oversight. Part, at least, of the original collection of *L. Fremontii* is deposited at the Gray Herbarium, and *L. erecta* is clearly a synonym. The species is a good one. It is distinguished from *L. Redowskii* by the double row of prickles and from *L. echinata* (its nearest relative) by the distinctly larger nutlets, the more irregular distribution of the prickles, and the tendency of the median tuberculations to become more prominent, differences well noted by TORREY in his original diagnosis (Pacif. R.R. Rep. 12:46. 1860).

Specimens examined: ASSINIBOIA: Crane Lake, June 15, 1894, *John Macoun* (5807); WYOMING: Fort Steele, Carbon County, June 16, 1900, *Aven Nelson* (7257); Chug Creek, June 29, 1900, *Aven Nelson* (7302); Laramie, Albany County, June 10, 1900, *Aven Nelson* (7269); UTAH: Carter Dugway, Uintah Mountains, July 19, 1902, *Leslie N. Goodding* (1410).

3. LAPPULA CENCHRUSOIDES A. Nels. Bull. Torr. Bot. Club 26:243. 1899.—GREENE (*loc. cit*) states that this is a synonym of *L. Fremontii*. It is much nearer a *Lappula* of Asia. *L. cenchrusoides* is low, bushy branched, with the pubescence so scanty that the herbage has a clear green hue, giving an aspect that is entirely different from that of the strict gray-pubescent *L. Fremontii*. The fruits, too, are much larger and are not mature until late August or September, long after *L. Fremontii* has dried away. The only specimens we have seen are from sandy canyons in the Laramie Hills. These are identical with specimens of the Asian *L. semiglabra* (Ledeb.) Gurke, except that the prickles are in two rows.

4a. LAPPULA REDOWSKII (Hornem.) Greene var. OCCIDENTALIS (Wats.) Rydb.—This variety has always been supposed to be confined to North America. It is, however, impossible to distinguish the Siberian specimens referred to the species by LEDEBOUR, DECANDOLLE, and others. HOOKER (Fl. Brit. India 4:163) gives what seems to be the correct range for the species. HORNEMANN (Hort. Hafn. 1:174) stated that the original was sent from Moscow and purported to have been collected in "Imperio Ruthenico," probably somewhere in Southwestern Russia. The supposed differences in branching break down completely, but the repeatedly described fruiting differences are well marked.

There is another interesting variation of the species that has been collected in this country on ballast. This is *L. patula* (Lehm.) Aschers. WATSON (Bot. King Exped. 246. 1871) gives a somewhat exaggerated figure but a good presentation of its diagnostic characters. He writes "differs from *E. Redowskii* only in the tuberculations upon the fruit, which are few in number and arranged regularly in longitudinal rows upon the back and upon the outer edge of the sides." Some of the specimens are separated from *L. Redowskii* only with difficulty. HOOKER as long ago as 1885 (Fl. Brit. India 4:163), in a note after *E. Redowskii*, wrote "perhaps

E. patulum Lehm. is not specifically distinct." Altogether, it seems well to treat it as a variety. Like the species, it is a native of Southern Asia and Southeastern Europe.

4b. LAPPULA REDOWSKII (Hornem.) Greene var. *patula* (Lehm.), n. comb.—*Echinosperrum patulum* Lehm. Asperif. 1:124. 1818.

Specimens examined: PENNSYLVANIA: Philadelphia, May 1877, *Isaac C. Martindale*; Greenwich Point, June 23, 1877, *Parker*; OREGON: Linnton, near Portland, July 12, 1912, *W. N. Suksdorf* (1930); AUSTRO-HUNGARY: between Paks and Komlod, *Haynald* (3707); ALGERIA: Hedna, 1865 (possibly introduced); ELISABETHPOL (in Caucasia), June 1834, *Hohenacker*.

5. LAPPULA CUPULATA (Gray) Rydb. Bull. Torr. Bot. Club 28:31. 1901.—*Echinosperrum Redowskii* (Hornem.) Lehm. var. *cupulatum* Gray, Bot. Calif. 1:530. 1876; *L. columbiana* A. Nels. Bot. Gaz. 34:28. 1902.—GREENE (Pitt. 4:94. 1899), referring to var. *cupulata*, wrote "that was made to include a number of easily definable species, and there is no determining to what one of the segregate species the name should be applied rather than to another." The first part of this statement is undoubtedly correct; but fortunately, as PIPER (Contrib. Nat. Herb. 11:475. 1906) indicated, the proper application of the name *cupulata* is perfectly clear. The original specimen cited by WATSON (*op. cit.* 247), no. 862, Trinity Mountains, Nevada, May 1865, and later indicated by GRAY (*loc. cit.*), is deposited in the Gray Herbarium. This plant is well described by AVEN NELSON (*loc. cit.*), who followed RYDBERG'S conception of *L. cupulata* (*loc. cit.*). The latter's remarks no doubt apply to the Rocky Mountain variety of *L. texana* (Scheele) Britton, a very different plant. *L. cupulata* (Gray) Rydb., in addition to its strong fruiting characters, has a very distinct range, as is shown by the following typical specimens.

IDAHO: Snake River Plains, 1893, *Edward Palmer* (19, 115, and 78); sandy soil, valley of Clearwater River, Nez Perces County, April 24, 1892, *Sandberg*, *Macdougall*, and *Heller* (17); OREGON: Pine Creek, Crook County, June 12, 1894, *J. B. Leiber* (213); eastern Oregon, 1898, *William C. Cusick* (1945); WASHINGTON: Almota, May 27, 1893, *C. V. Piper* (1703).

On the dry plains of southern Idaho and Wyoming a variation of the above occurs that is bushy branched, the branches floriferous nearly to the base, a variation common in this genus and always

intergrading more or less with the typical form. Extremes in habit so striking, however, are often well worthy varietal rank. Such is the case with

5a. *LAPPULA CUPULATA* (Gray) Rydb. var. **foliosa** (A. Nels.), n. comb.—*L. foliosa* A. Nels. in COULTER and NELSON Rocky Mountain Botany 413. 1909.

Specimens examined: IDAHO: dry stony plains, Castleford, Twin Falls County, June 26, 1912, *Nelson* and *Macbride* (1709); Snake River Plains, 1893, *Edward Palmer* (280); dry river bank, St. Anthony, July 5, 1901, *Merrill* and *Wilcox* (839); WYOMING: waste ground, Bench, Uinta County, June 25, 1902, *Leslie N. Goodding* (1188); gravelly slopes, Kemmerer, Uinta County, June 1, 1907, *Aven Nelson* (9015).

6. *LAPPULA TEXANA* (Scheele) Britton Mem. Torr. Bot. Club 5:27. 1894.—*L. collina* Greene, Pitt. 4:96. 1899.—It seems strange that this strong species has been misunderstood for so long. Ever since GRAY reduced it to his totally different var. *cupulata*, there is scarcely an annual *Lappula* that at some time or other has not masqueraded under the name. SMALL'S Fl. S.E.U.S. 997. 1913 contains the most nearly correct description that has come to notice. As indicated in the key, the species and its variations are separable at a glance from *L. cupulata* by the different fruit. The dissimilarity of nutlets is a striking character that is absolutely valid for the typical form. The following specimens (many from San Antonio, the type locality) indicate a range far removed from *L. cupulata*. Where the species meet in one form or another in the central Rocky Mountains, the fruit characters remain just as pronounced.

Specimens examined: TEXAS: San Antonio, April 17, 1894, *A. A. Heller* (1585); gravelly plain, San Antonio, April 1853, *George Thurber*; San Antonio, *G. Jermey* (225); San Antonio, 1841, *F. Lindheimer* (477); light sandy soils, Brown County, April, *J. Reverchon* (2117a); Comanche, May 10, 1900, *H. Eggert*; Abilene, May 20, 1902, *S. M. Tracy* (7833); El Paso, March 1851, *George Thurber* (153); NEW MEXICO: 1851, *C. Wright* (1573).

Northward the plant gradually assumes a habit entirely analogous to *L. cupulata* (Gray) Rydb. var. *foliosa* (A. Nels.) Nels. and Macbr., which, becoming extreme in Colorado and Wyoming, may be known as

6a. LAPPULA TEXANA (Scheele) Britton var. **heterosperma** (Greene), n. comb.—*L. heterosperma* Greene, Pitt. 4:94. 1899; *L. desertorum* Greene, *op. cit.* 95; *L. cucullata* A. Nels. BOT. GAZ. 34:29. 1902, at least as to specimens cited.—*L. cucullata* was described as having similar nutlets, but authentic specimens have exactly the nutlets of *L. heterosperma*.

Specimens examined: WYOMING: Sandy plains, Fort Steele, Carbon County, June 16, 1900, *Aven Nelson* (7250); sandy canyon, Birds Eye, Fremont County, June 22, 1910, *Aven Nelson* (9407); COLORADO: dry hills, Paradox, Montrose County, June 13, 1912, *E. P. Walker* (80); 1864, *Parry* (3).

6b. LAPPULA TEXANA (Scheele) Britton var. **homosperma** (A. Nels.), n. comb.—*L. heterosperma* Greene var. *homosperma* A. Nels. BOT. GAZ. 34:29. 1902.

Specimens examined: ASSINIBOIA: Medicine Hat, July 5, 1894, *John Macoun* (5806); MONTANA: Gallatin City, June 20, 1883, *F. Lamson Scribner* (172); COLORADO: New Windsor, Weld County, June 4, 1901, *George E. Osterhout* (2388); Mesa County, May and June, 1893, *H. C. Long*.

6c. LAPPULA TEXANA (Scheele) Britton var. **coronata** (Greene), n. comb.—*L. coronata* Greene, Pitt. 4:94. 1899.—This variety seems to be an extreme desert form of the south, almost too close to the preceding. It is a smaller plant, however, the nutlet margins being inordinately developed and the faces and sides smooth or merely somewhat papillose. A variation of *L. Redowskii* occurs in Europe which is not unlike this, the nutlets exhibiting the same tendency to smoothness.

Specimens examined: ARIZONA: dry plains near Camp Lovell, April 16, 1881, *C. G. Pringle* (362); dry hills, Santa Cruz, April, 1884, *W. F. Parish*, (164).

LAPPULA ARIDA Piper var. **Cusickii** (Piper), n. comb.—*L. Cusickii* Piper, Bull. Torr. Bot. Club 29:542. 1902.—Like the species except in the smaller and blue flowers. The forms are entirely similar in aspect and the nutlets are the same. Although the author suggested the possibility that future collections might prove *L. Cusickii* a synonym of *L. arida*, the size and color of the flowers of the former seem to remain constant, and therefore it may well be left as a variety.

LAPPULA SUBDECUMBENS (Parry) A. Nels. in COULTER and NELSON Rocky Mountain Botany 412. 1909.—PIPER, in his excellent revision of the western perennial species of *Lappula* (Bull. Torr. Bot. Club 29:539. 1902), wrote "*Echinospermum subdecumbens* Parry is probably a synonym of *L. diffusa*." Others have shared this view, so a few remarks calling attention to this evident error may not seem inappropriate.

LAPPULA DIFFUSA (as described) has glabrous or merely papillate corolla appendages. The material from the Wasatch Mountains, Utah, which represents the plant PARRY was writing about in Proc. Davenport Acad. 1:148. 1876, has softly pilose appendages. Moreover, where the species meet in Idaho they are consistently distinct as to color, *L. subdecumbens* being white or merely marked with blue, thus agreeing with material from the type region. These are two of the characters of which PIPER rightly makes so much. They are strengthened in this case by an evident difference in habitat. *L. subdecumbens*, PARRY tells us (*loc. cit.*), is "quite common in gravelly débris at the outlet of ravines," and GARRETT in his *Spring flora of the Wasatch region* notes that it grows on "dry plains and hillsides." *L. diffusa*, on the other hand, is a species of streamlands and woods or thickets. In southern Idaho and adjacent Nevada it is not infrequent to find the species growing within a few yards of each other, the one on the dryer, higher, and usually rocky places, the other on the moister and richer flats or slopes. The ranges of the two are at present not well enough known to be significant, but in all probability will later prove interesting. *L. caerulescens* Rydb., with long-hirsute appendages, is no doubt rightly treated by GARRETT as a variety of the Utah plant. It extends much farther north than the typical form.

Cryptantha muricata (Hook. and Arn.), n. comb.—*Myosotis muricata* Hook. and Arn. Bot. Beechy 369. 1840; *C. muriculata* (A.DC.) Greene, Pitt. 1:113. 1887.—DECANDOLLE, treating this plant as an *Eritrichium* (Prodr. 10:132. 1846), discarded HOOKER and ARNOTT'S name because of the earlier and valid *E. muricatum* (R. and P.) DC. The latter is now known to belong to the genus *Allocarya*. Accordingly, the earliest name, not

being preoccupied in the genus *Cryptantha*, must replace *muri-culata* DC.

LEHMAN's genus has been commonly spelled *Cryptanthe* ever since GREENE resurrected it. The first valid publication, however, seems to have been by FISCHER and MEYER in Sem. Hort. Petrop. 35. 1836, and there at least the name is *Cryptantha*.

CRYPTANTHA TORREYANA (Gray) Greene var. **grandiflora** (Rydb.), n. comb.—*C. grandiflora* Rydb. Bull. Torr. Bot. Club 36:679. 1909.—Because of the conspicuous corolla (5–6 mm. wide) this may well deserve varietal rank. The leaves are often, though not always, broader than those of the species.

Oreocarya salmonensis, n. sp.—Pallid throughout; duration unknown: stems solitary or few, apparently not tufted, simple, 1. 5–2 dm. high, distinctly angled, very leafy, white-hispid, and finely strigose with reflexed hairs: leaves (basal unknown) large for the genus, 3–8 cm. long, scarcely reduced below the inflorescence, oblanceolate or broadly spatulate, obtuse, the lower strongly 1-nerved, hispid-ciliate, petiolar portion about as long as the sparsely pustulate-hispid and finely and intricately pubescent blade: inflorescence thyrsoid-glomerate, dense, even in fruit: calyx lobes pubescent like the leaves, but not pustulate, linear-lanceolate, 5–7 mm. long in fruit: corolla white, the tube shorter than the calyx: anthers oblong: nutlets fully 3 mm. long, long-ovate, obtuse, acutely margined, smooth and shining, gray with a lighter indistinct keel on the back; scar linear, nearly as long as the nutlet, forked at the very base.

Unique among the short corolla species of the Northwest, being the only one with smooth nutlets. Equally distinct in leaf and inflorescence from the *O. multicaulis* group of the South and from *O. leucophea*. The type is by Charles L. Kirkley, "prairies, in loose soil," Salmon, Idaho, June 1896.

OREOCARYA CILIO-HIRSUTA Nels. and Macbr. BOT. GAZ. 55: 378. 1913 is *O. spiculifera* Piper, Contrib. Nat. Herb. 11:481. 1906. The species is very well marked by its usually numerous stems and striking pubescence.

Nicotiana Torreyana, n. n.—*N. attenuata* Torr. in Wats. Bot. King Exped. 276. 1871; not *N. attenuata* Steudel, Nom. ed. 1. 554. 1821.

PEDICULARIS CONTORTA Benth. var. **ctenophora** (Rydb.), n. comb.—*P. ctenophora* Rydb. Bull. Torr. Bot. Club 24:293. 1897.—Distinguished from the species by the more or less villous-ciliate calyx base. The variety has a purplish corolla, that of the species usually being yellow. Both forms occur in Montana and Yellowstone Park, but the variety seems to be confined to the eastern part of the plants' range.

Besides the type, the following collections may be noted: MONTANA: near snow, July 17, 1880, *Watson* (326); YELLOWSTONE PARK: 1884, *R. S. Williams* (809); WYOMING: Bighorn Mountains, July 19, 1900, *J. G. Jack*.

MIMULUS LANGSDORFII Don var. **microphyllus** (Benth.), n. comb.—*M. microphyllus* Benth. DC. Prodr. 10:371. 1846; *M. luteus* L. var. *depauperatus* Gray.—As pointed out by GRAY in Syn. Fl. 448. 1886, this often grows with the typical form. Such is not always the case, however; and when it is found by itself its slender and few-flowered stems, and small leaves and flowers make it hard to consider it as identical with the well developed state.

CASTILLEJA PILOSA (Wats.) Rydb. var. **inverta** (Nels. and Macbr.), n. comb.—*C. fasciculata* A. Nels. var. *inverta* Nels. and Macbr. BOT. GAZ. 55:381. 1913.—Although bearing a striking resemblance to the species to which we first referred it, the plant is rather a variation of *C. pilosa*, since it has the unequally cleft calyx of that species. The short corolla and the short, fine pubescence seem to make it the connecting link between two groups in this genus.

CASTILLEJA CONFUSA Greene, Pitt. 4:1. 1899.—An examination of a large amount of material in this group (the *miniata* group), both in herbaria and in the field, has convinced us that some of the characters relied upon to maintain proposed species are both inconstant and inconsequential. For instance, *C. confusa*, when rightly interpreted, should not be confined to plants that have the two primary calyx lobes so deeply cleft that the calyx appears 4-lobed, for this character exists in all degrees, but should include all those plants of its alliance with galea only one-half to one-third as long as the tube. The latter is a fairly constant character and must be the chief if not the only means, often, of separating *C. confusa* from *C. miniata*, in which it was at one time included.

The galea of the latter plant is nearly or quite as long as the tube. Measured by this yardstick the group divides into two species which are more or less distinct in habit and aspect. Both present interesting and analogous variations in pubescence; one, *C. rexifolia* var. *pubens* Nels. and Macbr., with this interpretation of *C. confusa* must become

CASTILLEJA CONFUSA Greene var. **pubens** (Nels. and Macbr.), n. comb.—*C. rexifolia* Rydb. var. *pubens* Nels. and Macbr. BOT. GAZ. 55:380. 1913.

CASTILLEJA MINIATA Dougl. var. **crispula** (Piper), n. comb.—*C. crispula* Piper, Contrib. Nat. Herb. 11:516. 1906.—The bracts, at least the uppermost, are few-toothed near the apex. The species varies somewhat in the dissection of the bracts.

CASTILLEJA ANGUSTIFOLIA (Nutt.) G. Don var. **subcinerea** (Rydb.), n. comb.—*C. subcinerea* Rydb. Bull. Torr. Bot. Club 40:484. 1913.—Since FERNALD published his discriminating analysis of this group (Eryth. 6:41-51), several additional species have been described, among them *C. subcinerea* Rydberg. This form is of particular interest as it in some degree connects *C. angustifolia* and its varieties with *C. Bennittii* Nels. and Macbr. of southwestern Idaho. The latter is very distinct, however, by reason of its subequal corolla and calyx and the color of its bracts (old rose). The eastern Idaho plant (*C. subcinerea*), although simulating *C. Bennittii* in pubescence, has the well-exserted corolla and relatively long calyx (2-3 cm.) of the old species. It would seem conducive to clearness and more natural, therefore, to treat it as another variety of *C. angustifolia*, regarding its pubescence as its most marked characteristic.

CORDYLANTHUS BICOLOR A. Nels. BOT. GAZ. 54:416. 1912.—RYDBERG (*loc. cit*) states that this species "is evidently the same as *Adenostegia ciliosa* Rydb." The latter, however, is the same as *C. ramosus* Nutt., which has 4 stamens and 2-celled anthers. *C. bicolor* is distinguished from *C. capitata*, its nearest relative, which has 2 stamens and 1-celled anthers, by its viscid-glandulosity and the presence of a rudimentary anther cell.

Ricinophyllum horridum (Sm.), n. comb.—*Panax horridum* Sm. Rees Cycl. 26: no. 10. 1812; *R. americanum* Pall. ex Ledeb.

Fl. Ross. 2:375. 1844; *Fatsia* and *Echinopanax* Dcne. and Planch. Rev. Hort. 4:105. 1854.—This widely distributed and conspicuous plant ought to bear its acknowledged earlier designation.

Gnaphalium Ivesii, n. n.—*G. decurrens* Ives Am. Jour. Sci. 1:380. 1819, not L. Syst. ed. 10. 1211. 1758.

Gnaphalium Grayi, n. n.—*G. strictum* Gray, Pacif. R.R. Rep. 4:110. 1858, not Moench, Meth. Pl. Hort. Bot. et Agric. 576. 1794; nor Roxb. Hort. Bengal. 61. 1814.

Gaillardia crassifolia, n. sp.—Apparently perennial from a thickened semi-fleshy root, pale green, sparsely pubescent with fine, short, jointed hairs, the pubescence extending to all parts of the head: stems few to several from the crown, branching from near the base and upward, striate, 3–5 dm. high, the upper third pedunculate: root leaves (wanting) probably early deciduous; the lower stem leaves narrowly oblanceolate, 3–8 cm. long, on slender-margined petioles often as long as the blade; the upper narrower, becoming linear and nearly sessile; heads medium; the disk 15–20 mm. broad, corollas purplish above; rays yellow, rather short (15 mm. or less), cleft into narrowly oblong lobes: achenes short, densely pubescent all over: pappus longer than the achene, the weak awn longer than the scarious portion.

M. E. Jones no. 5177, La Verken, Utah, May 7, 1894, is the type. Another specimen by *Jones* from Green River, Utah, June 21, 1889, is doubtfully referred to the proposed species.

SENECIO CANUS Hook. var. **celsus** S. S. Sharp, n. var.—More densely tomentose, usually with a tuft of white wool at the base: stems stouter, single, or somewhat tufted (not tufted as in the species), 3.5–5 dm. high: basal leaves oval, repand, dentate, or sinuately dentate, obtuse, 2–3 cm. broad, larger than in the species; upper leaves oblong-lanceolate, sinuately dentate, mostly sessile: heads 12–20, in a subumbellate cyme, 15 mm. broad, on peduncles 3–10 cm. long; bracts sometimes dark-tipped, silky-hairy or often tomentose at base; rays about 10.

The type was found on grassy banks in Little Goose Canyon, 15 miles south of Sheridan, Wyoming, at an elevation of about 5000 feet, no. 362, *Seymour S. Sharp*, June 22, 1913. No. 2332, *Aven Nelson*, from exactly the

same locality July 15, 1896, is also typical. In size and general aspect, this variety seems to differ considerably from typical forms of *S. canus*.

Hieracium cineritium, n. n.—*H. cinereum* Howell, Fl. N.W. Am. 396. 1901, not Doell, Rhein Fl. 524. 1843; *et al.*

MICROSERIS NUTANS (Geyer) Gray var. **major** (Gray), n. var.—*M. major* (Gray) Sch. Bip. 1866; see *Kew Index* and GRAY *Syn. Fl.*—Except for the large heads this plant has no constant character different from the typical form.

MICROSERIS NUTANS (Geyer) Gray var. **macrolepis** (Rydb.), n. comb.—*Ptilocalais macrolepis* Rydb. Bull. Torr. Bot. Club 38:11. 1911.—This is exactly like the variety *major* (Gray) Nels. and Macbr. except for the lanceolate-attenuate and elongate pappus scales. Thus intermediate between the species and the latter variety, which belongs to Oregon and Idaho, it seems best to consider it a geographical variant.

The following specimens may be noted in addition to those cited by RYDBERG: UTAH, Salt Lake City, May 1869, *Sereno Watson* 696 (referred by GRAY *Syn. Fl.*, to *M. major*); Fort Douglas, May 25, 1908, *Mrs. Joseph C'emens*; Emmigration Canyon, Salt Lake County, June 14, 1913, *A. O. Garrett* (2726b).

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